Preliminary problems. These problems should be completed before discussion on Thursday.

(P1) Draw the convex hull of

$$\{(1,1), (2,3), (2,4), (3,2), (4,2), (4,4)\}$$

in $\mathbb{R}^2$. How many vertices does this polytope have?

(P2) Fill in below the H-description of the polytope P drawn in (P1).

Note: you may change "1" to "-1" in the right hand side when appropriate, but no other modifications to the right hand side are necessary.

$$\begin{pmatrix} \frac{1}{4} & 0 \\ \underline{\quad} & \underline{\quad} \\ \underline{\quad} & \underline{\quad} \\ \underline{\quad} & \underline{\quad} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \leq \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix}$$